# Etoposide

**Cat. No.:** HY-13629

**CAS No.:** 33419-42-0

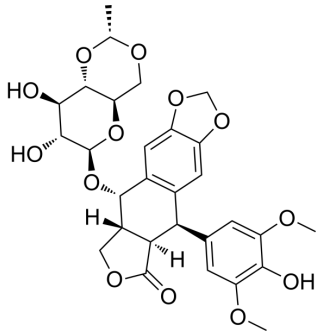
**Molecular Formula:** $C_{29}H_{32}O_{13}$

**Molecular Weight:** 588.56

**Target:** Topoisomerase; Autophagy; Mitophagy; Apoptosis; Bacterial; Antibiotic

**Pathway:** Cell Cycle/DNA Damage; Autophagy; Apoptosis; Anti-infection

**Storage:** 4°C, protect from light
* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



## SOLVENT & SOLUBILITY

**In Vitro**

DMSO : ≥ 39 mg/mL (66.26 mM)
* "≥" means soluble, but saturation unknown.

| Preparing Stock Solutions | Mass / Solvent / Concentration | 1 mg | 5 mg | 10 mg |
|---|---|---|---|---|
| | 1 mM | 1.6991 mL | 8.4953 mL | 16.9906 mL |
| | 5 mM | 0.3398 mL | 1.6991 mL | 3.3981 mL |
| | 10 mM | 0.1699 mL | 0.8495 mL | 1.6991 mL |

Please refer to the solubility information to select the appropriate solvent.

**In Vivo**

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (4.25 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (4.25 mM); Clear solution
3. Add each solvent one by one: 5% DMSO >> 40% PEG300 >> 5% Tween-80 >> 50% saline
   Solubility: ≥ 2.5 mg/mL (4.25 mM); Clear solution
4. Add each solvent one by one: 5% DMSO >> 95% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (4.25 mM); Clear solution
5. Add each solvent one by one: 1% DMSO >> 99% saline
   Solubility: ≥ 0.5 mg/mL (0.85 mM); Clear solution

## BIOLOGICAL ACTIVITY

**Description**

Etoposide (VP-16; VP-16-213) is an anti-cancer chemotherapy agent. Etoposide inhibits topoisomerase II, thus stopping DNA replication. Etoposide induces cell cycle arrest, apoptosis and autophagy[1].

| | |
|---|---|
| **$IC_{50}$ & Target** | Topoisomerase II |

**In Vitro**

Etoposide is capable of causing cytotoxicity on pancreatic β-cells by inducing apoptosis through the JNK/ERK-mediated GSK-3 downstream-triggered mitochondria-dependent signaling pathway in RIN-m5F cells[1].
Etoposide and Anti-Human VEGF significantly abolish P1 sphere-forming ability, an effect associated with apoptosis of this subset of cells[2].
Etoposide phosphate (0-1μM; 72 hours) inhibits HCT116 $FBXW^{+/+}$, $FBXW^{-/-}$ and $p53^{-/-}$ as a dose-dependent manner, exhibits $IC_{50}$s of 0.945 μM; 0.375 μM; and 1.437 μM, respectively[5].
Etoposide (25 μM; 6 hours) delays p53 recover in FBXW7-deficient cells. In addition, FBXW7 expression is disappeared in $FBXW7^{-/-}$ cells[5].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay[5]

| | |
|---|---|
| Cell Line: | HCT116 $FBXW^{+/+}$, $FBXW^{-/-}$ and $p53^{-/-}$ cells |
| Concentration: | 0.025 μM, 0.05 μM, 0.075 μM, 0.1 μM, 0.2 μM, 0.4 μM, 0.6 μM, 0.8 μM, 1 μM |
| Incubation Time: | 72 hours |
| Result: | Inhibits HCT116 $FBXW^{+/+}$p>, $FBXW^{-/-}$ and $p53^{-/-}$ cell growth as a concentration manner. |

Western Blot Analysis[5]

| | |
|---|---|
| Cell Line: | HCT116 $FBXW7^{+/+}$ or $FBXW7^{-/-}$ cells |
| Concentration: | 25 μM |
| Incubation Time: | 6 hours |
| Result: | Exhibited that the recovery of p53 levels after DNA damage is mediated by FBXW7. |

**In Vivo**

Etoposide (50 μM) and Anti-Human VEGF-treated hypoxic cells injected intravenously into immunodeficient mice reveals a reduced capacity to induce lung colonies, which also appear with a longer latency period[2]. Etoposide (10 mg/kg/day, i.v.) with NSC 109724 and NSC 241240, reduces the tumor volume in the hepatoblastoma cell injected NMRI nude mice[3].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

## CUSTOMER VALIDATION

- Immunity. 2022 Aug 9;55(8):1370-1385.e8.
- Cell Host Microbe. 2023 Nov 8;31(11):1820-1836.e10.
- Protein Cell. 2022 Jan;13(1):47-64.
- Nat Commun. 2023 Sep 19;14(1):5709.
- J Extracell Vesicles. 2022 Apr;11(4):e12206.

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## REFERENCES

[1]. Lee KI, et al. Etoposide induces pancreatic β-cells cytotoxicity via the JNK/ERK/GSK-3 signaling-mediated mitochondria-dependent apoptosis pathway. Toxicol In Vitro. 2016 Jul 26. pii: S0887-2333(16)30147-3.

[2]. Calvani M, det al. Etoposide-Anti-Human VEGF a new strategy against human melanoma cells expressing stem-like traits. Oncotarget. 2016 Jun 9. doi: 10.18632/oncotarget.9939.

[3]. Fuchs, J., et al. Comparative activity of NSC 119875, NSC 109724, NSC 123127, NSC 241240, and etoposide in heterotransplanted hepatoblastoma. Cancer, 1998. 83(11): p. 2400-7.

[4]. Hande KR, et al. The Importance of Drug Scheduling in Cancer Chemotherapy: Etoposide as an Example. Oncologist. 1996;1(4):234-239.

[5]. Cui D, et al. FBXW7 Confers Radiation Survival by Targeting p53 for Degradation.Cell Rep. 2020 Jan 14;30(2):497-509.e4.



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